Journal of Mathematics Education
Website: http://usnsj.com/index.php/JME
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THE EFFECT OF VAN HIELE LEARNING MODEL TOWARD GEOMETRIC REASONING ABILITY BASED ON SELF-EFFICACY OF SENIOR HIGH SCHOOL STUDENTS

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ARTICLE INFO
ISSN: 2528-2468
Vol. 1, No. 2, July 2016
URL: http://usnsj.com/index.php/JME

Abstract

The problem in this research is the low geometric reasoning abilities related to levels that van Hiele level 2 (abstraction) and level 3 (deduction) are not achieved its full potential. This research is a quasi experimental design with nonequivalen control group design. This is influenced by the students' ability to reason logically problem remains low, there has been no student's readiness or understanding of mathematical concepts is not optimal. Low student confidence shown from negative attitudes to learning. Based on the results of the study found that: 1) learning model van Hiele had a greater impact than conventional learning models to geometric reasoning abilities of students; 2) learning model van Hiele had a greater impact than conventional learning models to geometric reasoning skills in students who have high self-efficacy; 3) The learning model van Hiele had a greater impact than conventional learning models to geometric reasoning skills in students who have self-efficacy were; 4) There is no influence of van Hiele model of learning and conventional learning models to geometric reasoning skills in students who have low self-efficacy.

Key words: Geometric reasoning skills, self-efficacy and van Hiele Learning Model

A. Introduction

Mathematics is a science that is very useful in solving the problems of life and in an effort to understand the other sciences. In each level of education, learning mathematics for students is not easy, because math is abstract. Especially for students who are still in junior high school, especially the eighth grade students who ditutut to think abstractly and understand verbal symbols, are still experiencing difficulties.

Advances in science and technology are one of which is based on mathematics. Mathematics is the science that addresses both the pattern regularity patterns in nature and in the human mind. The development of mathematics impact on expanding the horizon of thinking that requires readiness of educators and students face the challenges of globalization. Opportunities and challenges are always hand in hand. Educators can not be separated from the demand to constantly improve the quality of education is not only chasing the target imposed curriculum and the students are required to be creative and develop its potential.

Khoiriyyah, et al (2013: 19) states that the reality on the ground shows that the majority of students still did not master the material geometry, one high school levels. In fact, one of the branches of mathematics is geometry basically has a greater opportunity to understand the students compared with other branches of mathematics. This is because the ideas of geometry already known by the students early before they enter school, for example, line, area and space (Abdusakkir, 2010).

Saragih (2011: 5) revealed that low ability students in geometry, particularly with respect to spatial inseparable from the learning process. Facts on the ground generally indicate that math teachers place more emphasis on aspects of memory geometry. Although the teacher has used props to cultivate students' reasoning about concepts of geometry, but teachers often rush directing students understand geometry through the two-dimensional image.

Reality on the ground, based on a preliminary study conducted in SMA Negeri 1 Wundulako regard geometric reasoning ability of students is low. Among the evidence that there is the matter of which have been tested to measure students' geometric reasoning ability, the dominant air-problems at level 2 and level 3. Most of the students of class X 30 samples are not ready at level 2 or 3 or level of abstraction and formal deduction, because only 27% and 7% of students who reach that level. Problems indicated in reasoning abilities geometric students namely at the level of abstraction related to the ability of intuition spatial students classified as weak when students had to imagine something abstract, predominantly students find it difficult to solve problems at the level of the late counting by associating concepts previously learned, the basic concept which is a prerequisite of three dimensional material is low both the understanding of basic geometry in junior high school, the concept of Pythagoras and algorithm processing errors. Meanwhile, students of class XI student of 30 samples of 16.5%, 8.8%, 3% and 3.8%, is at level 0, 1, 2, and 3. It is influenced because the student's ability to reason the problem is logic is still low, basic knowledge of mathematics is low, there is no readiness of students in work on the problems that are different from the sample questions created teacher or understanding of mathematical concepts is not optimal.

Students have the confidence (self-efficacy) lower by preliminary observations that students' attitudes toward learning mathematics, among them was pessimistic when faced with a mathematical problem, quickly surrendered and was not going to work before trying. Students are not confident in solving mathematical problems, not like the challenges, doubts about his ability. Most students also feel fear in expressing their opinions and ask the teacher if you have trouble learning math, not actively involved in the learning, when the teacher asked some students to work on the problems on the board they are dominant not confident just those commonly designated ride answered, Other negative attitudes in learning mathematics impact on the student's knowledge does not develop optimally.

Budiarto (2000: 439) states that the purpose of learning geometry is developing the ability to think logically, developing spatial intuition, imparting knowledge to support other materials, and can read and interpret mathematical arguments. Learning geometry related to the reason. In line with Budiarto, Bobango (1993: 148) said that the purpose of learning geometry is that the students gain confidence about her math skills, be good problem solvers, to communicate mathematically, and to reason mathematically.

The confidence of the students affects the level of knowledge that will be achieved. In the sense that when students try, practice and diligent in learning it will be a positive influence on mathematics learning outcomes. With the confidence of the students are expected to become more personally prepared with the challenges in dealing with problems in everyday life, especially to solve mathematical problems. Confidence would be better if more forward directed learning activity discipline, responsibility, curiosity, initiative, innovation, and perseverance so that students can improve their geometric reasoning abilities.

Abdussakir (2002: 344) states that among the various branches of mathematics, geometry occupies the position of most concern. The difficulties of the students to learn geometry occurs from elementary to college level. This leads to learning difficulties less than perfect understanding of the concepts of geometry, which in turn inhibits further learning geometry.

High school students of class X in backing learned geometry on the three-dimensional material more emphasis on facts that partially studied and the basis of calculation is the working procedure of the "principle, to work on the problems thus necessary procedures such work". Analysis especially of spatial analysis of lacking in portions, so that spatial ability becomes weaker disclosed Krismanto (2004: 1).

Hidayat (2013: 40), based on observations he did, resulted that the space dimension three is one lesson material math class X SMA / MA is a material that is very difficult, to understand Because it is abstract and there are some problems as other causes items, namely : (a) the student's skills in drawing and use tools to draw shapes dimensional space of three still low, (b) the ability of understanding of mathematics concepts students are still less than satisfactory, (c) some students Rely on rote without understanding the concept that made a mistake do the problems, (d) the material Prerequisites include straight lines, angles, broad flat wake, trigonometry and the terms of entry into force of the Pythagorean theorem not yet mastered by most students.

Low geometry problems has inspired a variety of research based on a learning model van Hiele them conducted by Atebe and Schafer (2008), Mateya (2008). In addition, the van Hiele theory offers mostly hopes to meet the challenges of different levels of students' reasoning in geometry. The largest contribution to the van Hiele theory is that differences in the level of reasoning is under the control of teachers and can be facilitated with the right instruction disclosed Pusey (2003: 50).

Kepner (2006: 7) states that these levels van Hiele geometric reasoning is the visualization, analysis, deduction informal, formal deduction and accuracy. These five levels or stages on geometric reasoning above are also the thinking stages that must be passed students in understanding the geometry. Although the geometric reasoning simply specialize in learning geometry, but a lot of benefits that can be derived from levels or stages of geometric reasoning. Teachers can take advantage of the stages of cognitive development of children raised van Hiele. Teachers can find out why a student does not understand that the cube was the beam for these students thinking stage is still in the analysis phase down yet entered the stage of sorting.

Students in solving mathematical problems, there are several important cognitive components that should have and is highly dependent on the ability of reasoning. The first component is the understanding of the problem. Students understand the facts, concepts or principles. If the context is to develop new knowledge through problem solving then he must seek understanding concepts or principles contained in the matter. The second component ie after the new understanding gained new concepts linked to or associate with the knowledge and experience that has been previously owned. The third component is a metacognitive the students' ability to monitor, control and evaluates the work in solving the problem (Natiputulu, 2008: 168-169).

Educators as a reformer should continue to improve its ability to face the challenges of the future. Therefore, one capability that is expected to be explored and enhanced through learning mathematics is the geometric reasoning ability by applying the learning model van Hiele because generally the models of learning based on the principles and theories of supporters. According Sagala (2010: 64) regarding the learning model includes an extensive and thorough approach is not just a combination of the facts that are arranged at random but a systematic procedure to modify the behavior of learners based on certain assumptions.

Students will go through the level of thinking in studying and understanding the geometry different from each other inside the van Hiele theory, educators need to consider the level of development of student thinking in geometry. In this case the use of this model adapts to the intellectual development of students, it will be able to enhance the students' understanding of the material being taught teachers. The learning model van Hiele expected to be applied in the study of mathematics in order to develop geometric reasoning ability and self-efficacy of students. Because mathematics is also associated with one's confidence in solving math problems with certain levels of thinking that can be achieved by students.

Consider the condition of mathematics in high school at the moment and of the various concepts of thinking described above is deemed necessary for the improvement of learning by applying the learning model van Hiele and the lack of sufficient reasoning ability geometric and confidence (self-efficacy), especially students in SMA Negeri 1 Wundulako.

B. Literature Review

1. Geometric Reasoning Ability

Wing (1985: 6) states that "geometric reasoning is the process of defining and deducing the properties of a geometric entitiy using the intrinsic properties of that entity, its relationship with other geometric entities, and the rules of inference that bind such properties together in geometric (Euclidean) space ", which means that the reasoning geometric is the process of defining and deduce the properties of a whole geometry using the intrinsic properties of the force, to do with the unity of the geometry of the others, and rules to draw conclusions that really intertwined among the properties that exist in space geometry (Euclid). In other words, geometric reasoning includes complex aspects, namely: (1) define and deduce properties of geometry, (2) relate it to other aspects of the geometry, and (3) draw conclusions based on the rules (postulate) that already exist.

Van Hiele also split geometric reasoning ability into five levels. The level or levels of thinking through which students in understanding the geometry of the visualization, analysis, deduction informal, formal deduction, and accuracy, Kepner (2006: 7-8). In discussing the high school level to level 3 (formal deduction), where that third level of geometric reasoning on the high school level is reached then one way is to implement the fifth phase of the above (Khotimah, 2013: 10).

2. Van Hiele's Learning Model

Van Hiele learning model is a model of learning which involves five phases (steps) is: information, directed orientation, explication, free orientation, and integration. Clement (2004: 34) states that the theory would be useful if used, tested and modified. According to these criteria, the van Hiele theory is a theory that is useful. According Halat (2006: 8), some of the results of empirical studies mention that the van Hiele theory is useful in the development of the concept of geometry students, ranging from primary school to university.

Van de Walle (2006: 151) states that all levels to explain about how we think and type of geometry ideas of what we think, rather than how much knowledge we have. In addition, a significant difference from one level to the next level is the mental objects that that which we think geometrically.

3. Self-efficacy

Self-efficacy is one of the main concepts Bandura in his research. According to the theory and research Bandura (1995) self-efficacy to make a difference in the way people feel, think, act, and motivate yourself in terms of feelings (Zulkosky, 2009: 94). Of the various experts, self-efficacy in practice synonymous with "confidence" or "confidence", although "self-confidence" is a term which is non-descriptive, referring to the power of conviction, such a person can be very confident, but ultimately failed, Self-efficacy is defined as a person's judgment about his ability to reach a level of performance (performance) is desired or determined, which will affect the next action. Self-efficacy is one component of the self-regulated (independence) (Risnanosanti, 2009: 199).

C. Methodology

The research subject is class and SMA Negeri 1 Wundulako in the academic year 2013/2014 in Kolaka City East Sulawesi who can be divided into categories of students' self-efficacy (high, medium, and low). The division is carried out at the beginning to get a picture of geometric reasoning skills and confidence (self-efficacy) of students who passed the student in learning geometry. Selection was based on their school problems related to geometric reasoning skills and confidence (self-efficacy) students.

This study is a Quasi-Experimental research is the development of True Experimental, with Nonequivalen Control Group Design.

Elements of this study are determined by the category of self-efficacy mathematical students (high, medium and low), the category of van Hiele model of learning and conventional learning. To further clarify the reasoning geometric design of experiments (Y) by a factor learning model (A) and the factor of self-efficacy (B), as shown in the following table:

Table 1. Factorial 3x2 Design Analysis

Self-Efficacy (B)	Learning Model (A)		A1-A2
	van Hiele (A=1)	Conventional (A=2)	
Self-Efficacy High (B=1)	μ_{11}	μ_{12}	μ_{1j}
Self-Efficacy Average (B=2)	μ_{21}	μ_{22}	μ_{2j}
Self-Efficacy Low (B=3)	μ_{31}	μ_{32}	μ_{3j}
	μ_{i1}	μ_{i2}	

D. Finding and Discussion

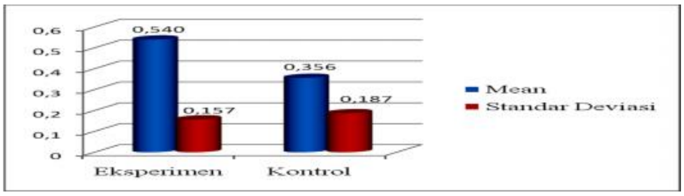
1. Findings

General overview of the geometric reasoning abilities of students after getting the van Hiele model of learning and conventional learning model based on the score (pretest) and (posttest), then calculated the gain is normalized (N-Gain) geometric reasoning abilities both in the experimental class and control class. Average of (mean) normalized gain derived from this calculation is the portrait of an increase in geometric reasoning abilities of students whose learning using van Hiele model of learning and learning using conventional learning models. Description of the calculation result can be seen in Table 2 below:

Table 2. Data of N-Gain of Geometric Reasoning Ability

Group	N	Geometric Reasoning Ability			
		$\overline{X}$	Standard of Deviation	Min.	Max.
Experimental	30	0,5397	0,15696	0,21	0,80
Control	31	0,3561	0,18660	0,00	0,68

Comparison of the average N-Gain and geometric reasoning abilities of standard deviation between the experimental group and the control group presented in bar charts in the following picture:



Picture 1
Mean and Standard Deviation N-Gain Geometric Reasoning Ability
Experiment and control groups

From Table 2 and Figure 1 shows that the average value of the N-Gain geometric reasoning ability or the experimental group of students whose learning meng-use learning model van Hiele (= 0.54) higher when compared to the control group or students who are learning to use the model conventional learning (= 0.356). This indicates that the increase in geometric reasoning abilities in the experimental class is better when compared with the increasing capability of geometric reasoning in the control group. In general, the quality improvement of geometric reasoning ability in the experimental class by using model van Hiele and grade control using conventional learning models included in the medium category can be seen from the average N-Gain of 0.5 which lies in the interval 0.3 and 0.7.

a) Testing Requirements for Analysis Statistics

Based on the test results data normality using the Kolmogorov-Smirnov test in SPSS 20 concluded that the data geometric reasoning abilities both groups normally distributed learning. It can be seen from all Asymp. Sig. (2-tailed) value is greater than the significance level of 0.05. Therefore, by using statistical parametric testing can proceed.

b) Uji Hipotesis

1. Reasoning Ability Test Data Discrepancies Both geometric Students Based Learning Group
   Testing data discrepancies geometric reasoning skills students are learning by both groups using t-test.
   The formulation of hypotheses to be tested is.
   H0: μi1 = μi2
   H1: μi1> μi2
   with μi1, μi2 row is an average geometric reasoning ability of students taught by van Hiele model of learning and taught by conventional learning models. From the test results signikansi difference geometric reasoning based geometric reasoning is based on two groups learning probability value (sig / 2.) is smaller than 0.025, which will be rejected. Thus, there is a significant difference on average geometric reasoning ability between the two groups of students learning.
2. Reasoning Ability Test Data Discrepancies geometric Students by Categories Self-efficacy High on Both Study Groups
   The formulation of statistical hypotheses tested were: M11 = μ12; : M11> μ12 with μ11, μ12, a row is an average geometric reasoning abilities of students with high self-efficacy categories in both study groups. From the test results signikansi difference geometric reasoning based geometric reasoning is based on self-efficacy is high both groups learning probability value (sig / 2.) is smaller than 0.025, which will be rejected. Thus, there is a significant difference on average geometric reasoning abilities of students based on high self-efficacy between the two study groups.
   Reasoning Ability Test Data Discrepancies geometric Students by Categories Self-efficacy in the Second Medium Group Learning

3. The formulation of statistical hypotheses tested were:
   M21 = μ22; : M21> μ22
   with μ21, μ22, a row is an average geometric reasoning abilities of students with the category of self-efficacy were the two learning groups t-test results showed that the probability (sig / 2.) is smaller than 0.025, so it was rejected. Thus, there is a significant difference on average geometric reasoning abilities of students in the category of self-efficacy were the two groups learning:
4. Reasoning Ability Test Data Discrepancies geometric Students by Categories Self-efficacy Low on the Second Group of Learning
   The formulation of statistical hypotheses tested were:
   M31 = μ32; : M31> μ32
   with μ31, μ32, respectively the geometric reasoning abilities of students with the category of self-efficacy was lower in both groups of study. T-test results showed that the probability (sig / 2.) Is greater than 0.025, so Ho accepted. Thus, there was no significant difference in the average geometric reasoning abilities of students in the low category of self-efficacy both study groups.

c) Data Analysis of Mathematic Self-Efficacy

1. Description of Mathematic Self-Efficacy

Self-efficacy data obtained through self-efficacy questionnaire. Self-efficacy questionnaire was given to the experimental group or the control group, before applying the learning model and conventional van Hiele which aims to get an overview of the level of confidence (self-efficacy) students. More details can be seen in Table 3 below:

Table 3. Category Data for *Self-Efficacy* level of Students in Twoo Learning Groups

Group	Category for Students' *Self-efficacy Level*	Number of Students
Experimental (30)	High	4
	Average	16
	Low	10
Control (31)	High	4
	Average	8
	Low	19

Based on Table 3 shows that the number of students who have self-efficacy with high category in a class experimental and control classes amounted to 4 people, self-efficacy with category of 16 people in the experimental class and 8 in the control class, and self-efficacy by category low of 10 people in the experimental class and 19 in the control group.

2. Student Work on Geometric Reasoning Ability Test
   The results of analysis of the student's work in completing the test the ability of geometric reasoning in terms of the use of the learning model is presented in Table 4 below:

Table 4. Mean of Each Aspect of Students' Geometric Reasoning Ability in terms of the Using of Learning Model

Level of Geometric Reasoning	Learning Model					
	van Hiele			Conventional		
	$\bar{X}$ pre	$\bar{X}$ pos	N-Gain	$\bar{X}$ pre	$\bar{X}$ pos	N-Gain
Visualisation	0,933	1,000	1,000	1,000	1,000	0,000
Analysis	1,333	1,967	0,951	1,613	1,831	0,5633
Abstraction	2,600	3,242	0,459	1,581	2,806	0,5064
Deduction	2,467	5,225	0,498	1,516	3,508	0,3072

Explanation: Level of ideal score 0 (visualisasi) = 1, level 1 (analysis) = 2, level 3 (abstraction) =4, and level 4 (deduction) = 8.

Table 4 shows that after students are taught by van Hiele model of learning and conventional learning models, geometric reasoning abilities of students has increased at every level of geometric reasoning. Students who receive learning model van Hiele obtain greater improvement at every level of geometric reasoning than students who received conventional learning models. International based on the increase in every level of reasoning geometrically at students who are taught by learning model van Hiele, level 1 (analysis) to solve the problem by not see the inter-relationship exists is level with the highest increase in the amount of 0.951 (high category) and level 2 (abstraction) resolve the problem by looking at the interrelationships that exist in the wake of three-dimensional space is level with the lowest increase in the amount of 0,459 (medium category). While improving every level of geometric reasoning in students taught with conventional learning models, level 1 (analysis) is an indicator with the highest increase in the amount of 0.5633 (medium category) and level 2 (deduction) level with the lowest increase in the amount of 0.3072 (low category).

Based on students' work to resolve any matter reasoning abilities geometric given after being taught by learning model van Hiele, it appears that students are able to solve the problem until the highest level is to solve the problem of reasoning geometric awarded at level 2 (analysis), level 3 (abstraction) and level 4 (deduction). However, in solving one problem still exists students in the process of calculation led to the final result to be one and not a few students who misinterpret the settlement of a matter filed in the matter of representing geometric reasoning ability van Hiele level.

3. Discussion

Factors that teachers use learning models affect the activity of students in the classroom during the learning activities. In the conventional study, teacher predominates learning activities that act as an information center, a source of knowledge, and not involve the student activity in learning. As a result, students are less interested and motivated to follow the lesson, students are difficult to understand the material in depth, learning is not meaningful and understood by the students. Students feel learning these days has nothing to do with future learning. Generally less conventional learning as a great opportunity to explore the knowledge that students are less develop the potential of students' thinking. Consequently troubled students in achieving the level or levels 2 or 3 van Hiele of questions that trained on the subject of three dimensions. Moreover, to be able to solve problems more challenging and difficult requiring high-level thought processes such as geometric reasoning is directed more at the non-routine or other mathematical thinking skills.

Geometric reasoning needs to be trained intensively, so it needs a learning model that allows students perform a geometric reasoning. The learning model van Hiele performed includes five stages that go hand in hand with the level or levels of geometric reasoning abilities of students passed. Alloy certain phases in the learning model van Hiele need to be intensified in learning to better support reasoning ability geometric students namely at the level or levels of certain dominant still problematic for students, learning pursued a more targeted at involving students explore knowledge, activity, and learning systematically.

Van Hiele learning model focuses on the ability of students' knowledge to be passed in the learning of mathematics, especially geometry lesson. Melatihkan learning process with questions that represent levels van Hiele will give an overview for teachers about the ability of students and teachers can provide learning by taking into account the level of development of students' knowledge and does not impose the knowledge of students still at the level below. Because although forced students can only receive knowledge through memorizing not understanding. Learning design in terms of teaching materials, students' worksheets are created to facilitate students' success in learning geometry. Applying the learning steps to follow the van Hiele's Learning Model. In order for the four levels van Hiele at the high school level visualization, analysis, abstraction, and deductions can be achieved in learning geometry. It is appropriate Khotimah opinion (2013: 10) that in order for the fourth level of geometric reasoning on the high school level is reached then one way is to implement the fifth phase; information, orientation directly, explanations, free orientation, and integration. In addition, Van de Walle (2006: 151) states that all levels to explain about how we think and type of geometry ideas of what we think, rather than how much knowledge we have. A significant difference from one level to the next level is the mental objects that that which we think geometrically.

Activities of students in the learning model van Hiele takes place in an optimal start of the activity in the group to resolve the issue with the levels van Hiele who has served on the worksheet, and activities in the classroom to interact with other groups through class discussion. In general, in this learning students are directed to be trained in solving geometry problems with tiers or levels van Hiele and describe the student's knowledge to be passed in learning geometry. Through a series of problems that are described in the teaching materials lead students to develop geometric reasoning abilities. Teachers guide students to use language that is precise and accurate to explain what is observed students to form their own knowledge through a series of problem-solving that is defined at LKS or exercises continue. LKS also is to train students to develop geometric reasoning ability that is when students try to solve the problems, they can complete in a study group with reference to the teaching materials or the direction of the teacher. Teacher directs students to find their own way to understand the concept through tasks assigned and students express these concepts verbally or in writing. In addition, the mathematics that has hierarkies concept, are related and connected with a series of previous learning. Hinting that matters geometric reasoning skills necessary for the achievement of the expected drilled. Therefore, by applying the learning model van Hiele implement and integrate phase indicators in the learning model van Hiele namely visualization, analysis, deduction informal, formal deduction. The next one is designed, modified in terms of teaching materials and learning tools leads to achievement levels van Hiele which increased from the previous level that has not been achieved or can maintain the levels reached.

The learning activities are designed in accordance with the level or levels and stages of learning model van Hiele leads to the principle of allowing the emergence indicators geometric reasoning abilities. This can be seen when students are working on worksheets, the students will conduct visualizing, analyzing, abstracting, and formal deduction on the scope of learning three dimensional geometry.

The learning model van Hiele with advantages compared to conventional learning model for students who have low self-efficacy did not have a significant influence resulting in learning are not given treatment at any time which leads to increased self-confidence (self-efficacy). Categorize self-efficacy only in the beginning to get an idea of the level of confidence (self-efficacy) of the students and based on the theory that students who have low self-esteem have less geometric reasoning abilities. So the impact on the ability of geometric reasoning on a particular indicator is not achieved or is not maximized.

The reality encountered that van Hiele learning model and conventional, not to significantly influence or significant in the group with low self-efficacy. Therefore, students who have self-efficacy (confidence) lower not actively involved in the learning, embarrassed to ask the teacher if you have trouble, and the basic concept is weak as a three dimensional learning requirements. Although the learning model layer van Hiele seek to reach students with different levels of self-efficacy characteristics in order to obtain an overview of students' knowledge levels. However, van Hiele model of learning is taught to groups of students who have low self-efficacy requires the basic concepts and learning experiences are more associated with the material preconditions that must first be mastered by students. So that work on the problems that measure geometric reasoning ability and level of accuracy less impact on results yet achieved the maximum. This fact is an issue for the group of students who have low self-efficacy. They have difficulty or problem in the operation of the algorithm of questions that measure the geometric reasoning ability at level 2 or 3 on a certain subject in the three dimensions of learning that are not achieved. For those students who are taught by conventional learning models that have a low confidence results of their study were more likely to remain (monotone), knowledge is not growing, tiers or levels van Hiele still problematic both at level 0, 1, 2, or 3 in some subjects three-dimensional. In addition, conventional learning more centered on the teacher, not giving students the opportunity to engage in learning, did not materialize multidirectional communication such as group activities to solve geometry problems.

E. Conclusion

Based on the results of this study concluded that: 1) learning model van Hiele had a greater impact than conventional learning models to geometric reasoning abilities of students; 2) learning model van Hiele had a greater impact than conventional learning models to geometric reasoning skills in students who have high self-efficacy; 3) The learning model van Hiele had a greater impact than conventional learning models to geometric reasoning skills in students who have self-efficacy were; 4) There is no influence of van Hiele model of learning and conventional learning models to geometric reasoning skills in students who have low self-efficacy.

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